

Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently Amended) An electronic apparatus including an active matrix device, said device comprising:

- a gate line formed over a substrate;
- a source line formed over said gate line;
- a switching element including a thin film transistor formed at an intersection between said gate line and said source line wherein said source line is electrically connected to a source of said switching element;
- a metal interconnection electrically connected to a drain of said switching element wherein said metal interconnection is positioned in a same layer as said source line;
- an interlayer insulating film comprising lower and upper insulating layers formed over said source line, said metal interconnection and said switching element, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;
- a light blocking conductive film formed on said interlayer insulating film, further comprising wherein a capacitor is formed at said opening between said light blocking conductive film and said metal interconnection with said lower insulating layer interposed therebetween; and
- a pixel electrode electrically connected to said metal interconnection and located over said light blocking conductive film,

wherein said switching element and said capacitor are provided in a region of a pixel where disclination is likely to occur;

wherein said electronic apparatus is selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

2. (Currently Amended) An electronic apparatus including an active matrix device, said device comprising:

a gate line formed over a substrate;
a source line formed over said gate line;
a switching element including a thin film transistor formed at an intersection between said gate line and said source line wherein said source line is electrically connected to a source of said switching element;
a metal interconnection electrically connected to a drain of said switching element;
an interlayer insulating film comprising lower and upper insulating layers formed over said source line, said metal interconnection and said switching element, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;
a light blocking conductive film formed on said interlayer insulating film;
a capacitor between said metal interconnection and said light blocking conductive film with said interlayer insulating film interposed therebetween; [[.]]
a pixel electrode electrically connected to said metal interconnection and located over said light blocking conductive film; [[.]] and
wherein said capacitor covers at least an active region of said switching element that is overlapped with one corner of a pixel where disclination is likely to occur due to a rubbing operation beginning in said corner; and
wherein said electronic apparatus is selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

3. (Cancelled)

4. (Currently Amended) An electronic apparatus including an active matrix device, said device comprising:
a plurality of gate lines extending in parallel and formed over a substrate;
a plurality of source lines extending orthogonally to said plurality of gate lines and formed over the substrate;
a plurality of pixels surrounded by said plurality of gate lines and said plurality of source lines;
at least one thin film transistor in each of said plurality of pixels;

an interlayer insulating film comprising lower and upper insulating layers formed over at least said one thin film transistor, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;

a pixel electrode formed over said thin film transistor in each of said plurality of pixels wherein said pixel electrode is electrically connected to the associated thin film transistor through a metal interconnect;

an orientation film formed on said pixel electrode wherein a surface of the orientation film has been rubbed in one direction from one corner of the pixel;

a black matrix formed above said thin film transistor and below said pixel electrode, said black matrix comprising a light shielding conductive film; and

an auxiliary capacitor formed between said black matrix and said metal interconnect in each of said pixels,

wherein said auxiliary capacitor is positioned so as to cover a part of said pixel including said one corner thereof; and

~~wherein said electronic apparatus is selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.~~

5. (Currently Amended) An active matrix device comprising:

a first substrate;

a second substrate opposed to said first substrate;

a thin film transistor formed over said first substrate, said thin film transistor comprising an active layer;

an interlayer insulating film comprising lower and upper insulating layers formed over the thin film transistor, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;

at least two source lines formed over said thin film transistor;

at least two gate lines intersecting to said two source lines respectively;

a metal interconnection connected to said active layer through a [[first]] contact hole formed in the interlayer insulating film;

a pixel surrounded by said two source lines and said two gate lines;

a light blocking film formed over said thin film transistor;

a capacitor formed between a portion of said metal interconnection and said light blocking film with said interlayer insulating film interposed therebetween;
a pixel electrode formed over said light blocking film; and
liquid crystal molecules arranged between said first substrate and said second substrate, said liquid crystal molecules oriented by rubbing in one direction from one corner of said pixel, wherein said portion is apart from the contact hole, and
wherein a disclination of said liquid crystal molecules occurs in a region comprising said one corner, and wherein said region and said capacitor overlap with each other.

6. (Previously Presented) A device according to claim 5, wherein said thin film transistor is selected from a top-gate thin film transistor and a bottom-gate thin film transistor.

7. (Previously Presented) A device according to claim 5, wherein said active matrix device is used for an electronic apparatus selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

8-10. (Cancelled)

11. (Currently Amended) An active matrix device comprising:
a first substrate;
a second substrate opposed to said first substrate;
a thin film transistor formed over said first substrate, said thin film transistor comprising an active layer;
an interlayer insulating film comprising lower and upper insulating layers formed over said thin film transistor, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;
at least two source lines formed over said thin film transistor;
at least two gate lines intersecting to said two source lines respectively;
a metal interconnection connected to said active layer;
a pixel surrounded by said two source lines and said two gate lines;
a light blocking film formed over said thin film transistor;

a capacitor formed between a portion of said metal interconnection and said light blocking film with said interlayer insulating film interposed therebetween;

a pixel electrode formed over said light blocking film; and

liquid crystal molecules arranged between said first substrate and said second substrate, said liquid crystal molecules oriented by rubbing in one direction from one corner of said pixel,

wherein a disclination of said liquid crystal molecules occurs in a region comprising said one corner, and wherein said thin film transistor and said capacitor are overlapped with said region.

12. (Previously Presented) A device according to claim 11, wherein said thin film transistor is selected from a top-gate thin film transistor and a bottom-gate thin film transistor.

13. (Previously Presented) A device according to claim 11, wherein said active matrix device is used for an electronic apparatus selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

14. (Currently Amended) An active matrix device comprising:

a first substrate;

a second substrate opposed to said first substrate;

a thin film transistor formed over said first substrate, said thin film transistor comprising an active layer;

at least two source lines formed over said thin film transistor;

at least two gate lines intersecting to said two source lines respectively;

a pixel having a rectangular shape surrounded by said two source lines and said two gate lines;

an interlayer insulating film comprising lower and upper insulating layers formed over at least said one thin film transistor, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;

a capacitor connected with said thin film transistor; and

liquid crystal molecules arranged between said first substrate and said second substrate, said liquid crystal molecules oriented by rubbing in one direction from one corner of said pixel,

wherein a disclination of said liquid crystal molecules occurs in a region comprising the one corner of said pixel, and wherein said region and said capacitor overlap with each other.

15. (Previously Presented) A device according to claim 14, wherein said thin film transistor is selected from a top-gate thin film transistor and a bottom-gate thin film transistor.

16. (Previously Presented) A device according to claim 14, wherein said active matrix device is used for an electronic apparatus selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

17-19. (Cancelled)

20. (Currently Amended) An active matrix device comprising:
a first substrate;
a second substrate opposed to said first substrate;
a thin film transistor formed over said first substrate, said thin film transistor comprising an active layer;
at least two source lines formed over said thin film transistor;
at least two gate lines intersecting to said two source lines respectively;
a pixel having a rectangular shape surrounded by said two source lines and said two gate lines;
an interlayer insulating film comprising lower and upper insulating layers formed over at least said one thin film transistor, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;
a capacitor connected with said thin film transistor; and
liquid crystal molecules arranged between said first substrate and said second substrate, said liquid crystal molecules oriented by rubbing in one direction from one corner of said pixel, wherein a disclination of said liquid crystal molecules occurs in a region comprising said one corner of said pixel, and wherein said thin film transistor and said capacitor are overlapped with said region.

21. (Previously presented) A device according to claim 20, wherein said thin film transistor is selected from a top-gate thin film transistor and a bottom-gate thin film transistor.

22. (Previously Presented) A device according to claim 20, wherein said active matrix device is used for an electronic apparatus selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

23-25. (Cancelled)

26. (Currently Amended) An active matrix device comprising:

a first substrate;

a second substrate opposed to said first substrate;

a thin film transistor formed over said first substrate, said thin film transistor comprising an active layer;

an interlayer insulating film comprising lower and upper insulating layers formed over the thin film transistor, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;

at least two source lines formed over said thin film transistor;

at least two gate lines intersecting to said two source lines respectively;

a metal interconnection connected to said active layer through a [[first]] contact hole formed in the interlayer insulating film;

a pixel surrounded by said two source lines and said two gate lines;

a light blocking film formed over said thin film transistor;

a capacitor formed between a portion of said metal interconnection and said light blocking film with said interlayer insulating film interposed therebetween;

a pixel electrode formed over said light blocking film; and

liquid crystal molecules arranged between said first substrate and said second substrate, said liquid crystal molecules oriented by rubbing in one direction from one corner of said pixel, wherein said portion is apart from the contact hole, and

wherein a disclination of said liquid crystal molecules occurs in a region comprising one corner of said pixel, and wherein said thin film transistor and said capacitor are overlapped with said region.

27. (Previously Presented) A device according to claim 26, wherein said thin film transistor is selected from a top-gate thin film transistor and a bottom-gate thin film transistor.

28. (Previously Presented) A device according to claim 26, wherein said active matrix device is used for an electronic apparatus selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

29. (Currently Amended) An active matrix device comprising:
a first substrate;
a second substrate opposed to said first substrate;
a thin film transistor formed over said first substrate, said thin film transistor comprising an active layer;
an interlayer insulating film comprising lower and upper insulating layers formed over said thin film transistor, wherein said upper insulating layer has an opening to expose said lower insulating layer in said opening;
at least two source lines formed over said thin film transistor;
at least two gate lines intersecting to said two source lines respectively;
a metal interconnection connected to said active layer;
a pixel surrounded by said two source lines and said two gate lines;
a light blocking film formed over said thin film transistor;
a capacitor formed between a portion of said metal interconnection and said light blocking film with said interlayer insulating film interposed therebetween;
a pixel electrode formed over said light blocking film; and
liquid crystal molecules arranged between said first substrate and said second substrate, said liquid crystal molecules oriented by rubbing in one direction from one corner of said pixel,

wherein a disclination of said liquid crystal molecules occurs in a region comprising said one corner, and wherein said thin film transistor and said capacitor are overlapped with said region.

30. (Previously Presented) A device according to claim 29, wherein said thin film transistor is selected from a top-gate thin film transistor and a bottom-gate thin film transistor.

31. (Previously Presented) A device according to claim 29, wherein said active matrix device is used for an electronic apparatus selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

32. (Currently Amended) A device according to claim 2, wherein said interlayer insulating film is comprised lower and upper insulating layers, said upper insulating layer has an opening to expose said lower insulating layer in said opening, and wherein said capacitor is formed at said opening.

33. (Currently Amended) A device according to claim 5, wherein said interlayer insulating film is comprised lower and upper insulating layers, said upper insulating layer has an opening to expose said lower insulating layer in said opening, and wherein said capacitor is formed at said opening.

34. (Currently Amended) A device according to claim 11, wherein said interlayer insulating film is comprised lower and upper insulating layers, said upper insulating layer has an opening to expose said lower insulating layer in said opening, and wherein said capacitor is formed at said opening.

35. (Currently Amended) A device according to claim 14, wherein said interlayer insulating film is comprised lower and upper insulating layers, said upper insulating layer has an opening to expose said lower insulating layer in said opening, and wherein said capacitor is formed at said opening.

36. (Currently Amended) A device according to claim 20, wherein said interlayer insulating film is comprised lower and upper insulating layers, said upper insulating layer has an opening to expose said lower insulating layer in said opening, and wherein said capacitor is formed at said opening.

37. (Currently Amended) A device according to claim 26, wherein said interlayer insulating film is comprised lower and upper insulating layers, said upper insulating layer has an opening to expose said lower insulating layer in said opening, and wherein said capacitor is formed at said opening.

38. (Currently Amended) A device according to claim 29, wherein said interlayer insulating film is comprised lower and upper insulating layers, said upper insulating layer has an opening to expose said lower insulating layer in said opening, and wherein said capacitor is formed at said opening.

39. (New) A device according to claim 1, wherein said electronic apparatus is selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

40. (New) A device according to claim 2, wherein said electronic apparatus is selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

41. (New) A device according to claim 4, wherein said electronic apparatus is selected from a video camera, a projector, a projection TV, a head-mounted display, a car navigation apparatus, a personal computer and a portable information terminal.

42. (New) A device according to claim 4, wherein said auxiliary capacitor is formed at said opening.